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RESEARCH

UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Electrification Administration  
Technical Standards Committees  
(Electric)

Supplement No. 1, October 1981, to  
REA Bulletin 43-5  
LIST OF MATERIALS ACCEPTABLE FOR USE ON  
SYSTEMS OF REA ELECTRIFICATION BORROWERS

The attached pages for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of July through September 1981. The following changes should be made in order to keep it up to date. Pages with a colon between are on the same sheet, both being changed.

<u>Add</u> <u>New Page</u>	<u>Remove</u> <u>Page</u>	<u>Add</u> <u>New Page</u>	<u>Remove</u> <u>Page</u>
d	d	fm	fm
1-3	1-3	sd(Cond.)	sd(Cond.)
p-12	p-12	se(Cond.)	se(Cond.)
u-2:u-3	u-2:u-3	zz-7	zz-7
v	v	U ae	U ae
w	w	U fz-1:U fz-2	U fz-1:U fz-2
y-1:y-2	y-1:y-2	U gp	U gp
y-3	y-3	U hv-2:U hv-3	U hv-2:U hv-3
z-1:z-2	z-1:z-2	U hv-4	U hv-4
z-3:z-4	z-3:z-4	U si-1	U si
aa,ab	aa,ab	U si-2	-
ag(Cond.)	ag(Cond.)		
ai-1	ai-1		
ai-2:ai-3	ai-2:ai-3		
an-1.4	an-1.4		
an-3.1	an-3.1		
an(1.1)	an(1.1)		
an(2.1)	an(2.1)		
an(3.1)	an(3.1)		
ap-1	ap-1		
ap-2	ap-2		
at-2:at(Cond.)	at-2:at(Cond.)		
av-1:av-2	av-1:av-2		
av-3:av-4	av-3:av-4		
av-5	av-5		
az	az		
cr	cr		
dh	dh		
du	du		
ei	ei		

RECEIVED



c - Bolt, machine

**Applicable Specifications:** Edison Electric Institute  
Specification TDJ-1 1969,  
"Specifications for Steel  
Bolts and Nuts"

**Applicable Sizes** : 1/2 inch diameter, 6 through  
10 inch length  
  
5/8 inch diameter, 6 through  
24 inch length  
  
3/4 inch diameter, 6 through  
26 inch length  
  
7/8 inch diameter, 6 through  
28 inch length

The following manufacturers have shown compliance with the applicable specifications for machine bolts:

A. B. Chance Company  
Dixie Electrical Manufacturing Company

Hughes Brothers  
\*Joslyn Manufacturing and Supply Company  
Kortick Manufacturing Company  
\*McGraw-Edison

Utilities Service Company



\*"Static proof" design available.

d - Washers  
Flat Steel

Size, inches:	2 1/4 x 2 1/4	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	1/4	3/16	1/2	12 gauge	10 gauge
Hole Diam., in.:	13/16	13/16	13/16	13/16	9/16	11/16

Chance	6814	6817	6818	6819 1/2	6803	6805
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Dixie	D6814	D6817	D6818	D6819 1/2	D6803	-
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Hughes	SW2 1/4-70	SW3-70	SW4-70	SW4-70 (1/2)	RW1-3/8-50	-
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Joslyn	J1076	J22596	J1080	J1473	J1086	-
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Kortick	K1553	K1555	K1557	K1559 1/2	K1524	K1525
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McGraw-Edison	DF2W5	DF2W7	DF2W10	DF2W15	DF1W2	DF1W3
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Utilities Serv.	5485	5487A	5488	5490A	5478	5479
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Size, inches:	2 1/4 x 2 1/4	3 x 3	3 x 4	4 x 4	3 round
Thickness, in.:	1/4	5/16	7/16	1/2	3/16
Hole Diam., in.:	11/16	11/16	15/16	13/16	13/16 (spurred)
Barron Bethea (Nodular Iron)	GCW-1A* BB-214	GCW-31*	CRW-4A*	GCW-41*	-
Bethea/National (Aluminum Alloy)	-	WC-33-5*	WC-34-7*	WC-44-6*	-
Continental (Nodular Iron)	-	CW-33-5*	CW-34-7*	CW-44-6*	TCSF-30-6
Flagg (MIF) (Malleable Iron)	P141* P56A	P143*	P120*	P144*	PX159A
Joslyn (Steel)	-	J114*	-	-	-
Lapp (Line Ware) (Malleable Iron)	304075* 304089	304078*	-	304082*	-

Power Line Hardware		CSW-33*	CRW-34*	CSW-44*
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\* Curved



1 - Deadend for Steel Strand (Overhead Ground Wire)

TRANSMISSION

For High Strength Steel Strand and Aluminum-Clad Steel Strand

<u>Manufacturer</u>	<u>Clamp Type:</u>		
	<u>High Strength Steel</u>	<u>Aluminum-Clad Steel</u>	
	<u>3/8" and 7/16"</u>	<u>7 No. 9 AWG</u>	<u>7 No. 8 AWG</u> <u>7 No. 7 AWG</u>
Anderson/Sq. D	SWDE-55N		
Ohio Brass	80437		

1 - Deadend for steel strand (overhead ground wire)

TRANSMISSION

For high strength, extra high strength steel strand and aluminum clad steel strand

Manufacturer	Compression Type					Extra High Strength
	High strength steel	Aluminum-clad steel			5/16" 3/8" 7/16"	
	3/8" 7/16"	7 No. 9 AWG	7 No. 8 AWG	7 No. 7 AWG		
Fargo (Alcan)	82S712	82S714	82A79	82A78	82A77	- 82S712 82S714
Alcoa	4620.12	4627.14				
Burndy	YTW375E	YTW438E	YTW7M9T	YTW7M8T	YTW7M7T	
Somerset	Order by wire size and type.					
Chance				16M AWSBG	20M AWSBG	
Helical Line Prod.			HG523-12.5M	HG525-16M	HG528-20M	



p - Connectors, Transmission

Bolted Type  
ACSR to ACSR  
ACSR to Copper

ALCOA

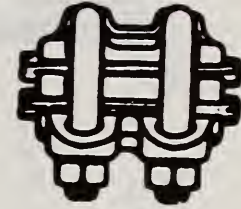
580 Series

Blackburn

2U Series

Burndy (ACSR to ACSR)

UP-A, UP-R



When ordering these clamps specify size, stranding and material of both conductors.

Compression Type  
ACSR to ACSR  
Same size



<u>Conductor Size</u>	<u>ALCOA</u>	<u>Anderson</u>	<u>Burndy</u>	<u>Kearney</u>	<u>ITT Blackburn</u>
1/0	5074.438	VCJS-50R	YCS25R	OHR-1/0-61AJ	RCJ10
2/0	5074.484	VCJS-50R	YCS26R	OHR-2/0-61AJ	RCJ20
3/0	5075.547	VCJS-61R	YCS27R	OHR-3/0-61AJ	RCJ30
4/0	5075.609	VCJS-61R	YCS28R	OHR-4/0-61AJ	RCJ40
266.8 kcmil	5076 Order by	VCJS-80R	YCS30R	HR-266-267AJ	RCJ266M
336.4 kcmil	5076 stranding	VCJS-80R	YCS33R	HR-336-267AJ	RCJ336M

ACSR to Copper

ALCOA	5070 Series
Anderson/Sq. D	VCJS
Burndy	YCR-R-CA
(Order by conductor sizes)	

p - Connectors

(Percussion type)

<u>Manufacturer</u>	<u>Aluminum to aluminum</u>	<u>Aluminum to copper</u>	<u>Copper to copper</u>	<u>Tap connections (Al to Al, Al to Cu)</u>
AMP	"Ampact" (Aluminum)	"Ampact" (Aluminum)	"Ampact" (Copper)	"Ampact" (Aluminum)

u - Deadend for galvanized steel guy strand

Strand Size:	1/4"	9/32"	5/16"	3/8"	7/16"
<u>Fargo</u>					
Bail for thimble eye	GDE-300	GDE-301	GDE-301	GDE-302	GDE-303
<u>Reliable</u>					
Bail for thimble eye	5100	5201	5201	5102	5103
Bail for guy insulator	5150	5251	5251	5152	5153

Automatic



Formed Type

<u>Chance</u>					
For standard guy	1/4 GSBG	9/32 GSBG	5/16 GSBG	3/8 GSBG	7/16 GSBG
For wrapped guy	1/4 GSC	-	-	3/8 GSC	7/16 GSC
<u>Helical Line Products</u>					
For standard guy	HG-207-1/4"	-	-	HG-210-3/8"	HG-211-7/16"
<u>Preformed Line Products</u>					
For standard guy	GDE-1104	GDE-1105	GDE-1106	GDE-1107	GDE-1108
For wrapped guy	WGL-2100	-	-	WGL-2103	WGL-2104



u - Deadend for alumoweld guy strand

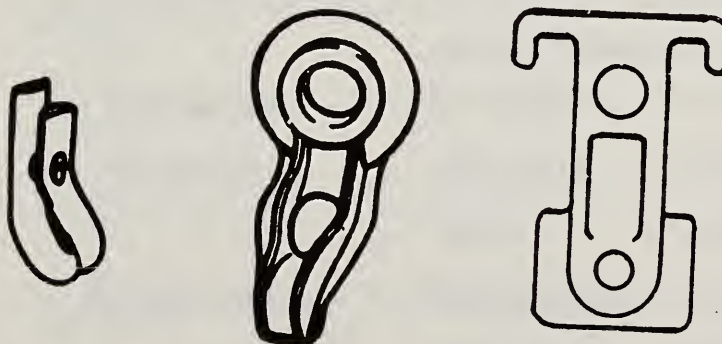
Strand Size	3#10(4M)	7#12(6M)	7#11(8M)	7#10(10M)	7X.110"(11.5M)	7#9(12.5M)	7X121"(14M)	7#8(16M)	7X.148"(20M)
<u>Chance</u>									
For standard guy		6M-AWSBG	8M-AWSBG	10M-AWSBG		12.5M-AWSBG			
<u>Helical Line Prod.</u>									
For standard guy		HG517-6M	HG519-8M	HG521-10M		HG523-12.5M			
<u>Preformed Line Prod.</u>									
For standard guy	AWDE-4108	AWDE-4110	AWDE-4113	AWDE-4116	AWDE-4118	AWDE-4119	AWDE-4120	AWDE-4122	AWDE-4126
For wrapped guy		WGL-4110	WGL-4113	WGL-4116		WGL-4120			

Automatic  
Alumoweld Guy Strand

Fargo	GDE-300	GDE-301	GDE-301	GDE-302
Reliable	5200	5201	5201	5202

v - Guy attachment  
for 5/8" bolt

<u>Type:</u>	<u>Formed Strap</u>	<u>Angle Bolt Eye</u>	<u>Guy Hook</u>	<u>Pole Eye Plate</u>
<u>Maximum Working Load Rating</u>	23,130 N (5200 lbs.)	23, 130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Anderson Elec./ Square D	-	-	-	GSP-05
Barron Bethea	-	-	GH-5*	-
Bethea/National	-	-	AG-5*	PE5-6A
Chance	5004	0100	C203-0168*	-
Continental Elec.	-	-	GA-54*	PEP-66-45
Dixie	D5004	D0100	DD-9460, DD9462*	-
Flagg (MIF)	-	-	PL35A, PL57X*	PX88
Joslyn	J25164	J6500	J6555, J6556	-
Kortick	K4035, K4047	K3140	-	-
Lapp (Line Ware)	-	-	304014*	304021
McGraw-Edison	DG6H1	DG11E1	DG21H1 DG21H2	-
Power Line Hardware	-	-	HGA-58C*	PGA-548
Util. Service	31030	5531	-	-



\*This hook may also be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.



Conditional List

v

July 1981

v - Guy attachment

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Joslyn Pole band, with cone head bolt J-6281 and guy clip J-6275 J-6280(for 6" to 10" pole) J-6270(for 8" to 14" pole)	745 8/16/62	To obtain experience. For distribution line only and 10,000 lbs. maximum loading.



w - Insulators, guy strain  
(These items shall conform to "REA Specifications  
for Guy Strain Insulators," D-12)

Max. Strand Dia., inches	3/8	1/2	5/8	5/8
Ult. Strength, pounds	10,000	12,000	20,000	20,000
Flashover, kV, Dry-Wet	25-12	30-15	35-18	40-23
ANSI Class	54-1	54-2	54-3	54-4

<u>Chance</u>	C909-1041	C909-1042	C909-1043	C909-1044
<u>Brown Boveri Elec.(ITE)</u>	502	504	506	556
<u>Joslyn (Pinco)</u>	L502	L504	L506	L289

<u>Ohio Brass</u>	31502	31504	31506	31352
<u>Porcelain Prod. (Knox)</u>	502	504	506	708

Insulators, guy strain  
(Fiber Reinforced Plastic)

Ult. Strength, pounds	11,000	15,000	21,000
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<u>Barron Bethea</u>	BB-11-CC Series	BB-15-CC Series	BB-21-CC Series
<u>Continental</u>	G-11 Series	G-15 Series	G-21 Series
<u>Dixie</u>	-	GIG-15 Series	GIG-25 Series
<u>Flagg (MIF)</u>	110 Series	150 Series	210 Series
<u>Joslyn-Empire</u>	400 Series	500 Series	650 Series
<u>Kearney</u>	-	321015	321021
<u>Plastigage</u>	HS11-1P Series	HSI-2X Series	HSI3-1P Series
<u>Shakespeare</u>	-	692 Series	694 Series

x  
July 1981

x - Rod, anchor

Applicable Specifications: Edison Electric Institute  
Specification TD-2, "Specifications  
for Strand Eye Anchor Rods"

Applicable Sizes: Single guy - 5/8 inch diam. 6, 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

Double guy - 5/8 inch diam. 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

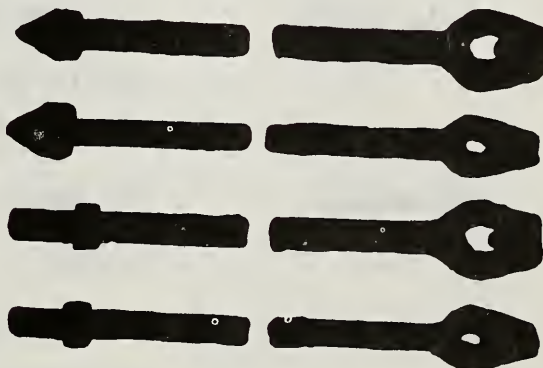
Single Guy Drive - 5/8 inch diam. 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

Double Guy Drive - 5/8 inch diam. 7 and 8 feet long  
- 3/4 inch diam. 8, 9 and 10 feet long  
- 1 inch diam. 9 and 10 feet long

The following manufacturers have shown compliance with the applicable specifications. Some manufacturers cannot supply all sizes listed above. Check with manufacturer or distributor for availability.

Blackburn  
Chance  
Dixie  
Grip-Tite

Joslyn  
Kortick  
McGraw-Edison  
Utilities Service



y - Galvanized Steel Strand

Applicable Specification: ASTM A475 (Class A, B or C Coating)

DISTRIBUTION GUY STRAND

Grade Size	Siemens Martin			High Strength (HS)				Extra High Strength (EHS)				
	1/4"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"
<u>Manufacturer</u>												
Alcan Cable	X	X	X	X			X	X	X			X
Armco Steel Corp.	X	X	X	X		X	X	X	X		X	X
Bethlehem Steel	X	X	X	X		X	X	X	X		X	X
CF&I	X	X	X	X		X	X	X	X		X	X
Cal-Wire	X	X	X	X	X	X	X	X	X	X	X	X
Davis Walker	X	X	X	X	X	X	X	X	X	X	X	X
Florida Wire and Cable	X	X	X	X	X	X	X	X	X	X	X	X
Indiana Steel and Wire	X	X	X	X	X	X	X	X	X	X	X	X
Paulsen Wire Rope Corp.	X	X	X	X			X	X	X			X
Seal Wire Co.	X	X	X	X			X	X	X			X
Southwire	X	X	X	X	X	X	X	X	X	X	X	X
Texstrand		X		X					X			
U. S. Steel	X	X	X	X	X	X	X	X	X	X	X	X

Note: The buyer should specify Class A, B or C coating per ASTM Specification A475.

y - Galvanized Steel Strand

Applicable Specification: ASTM A475 (Class A, B or C Coating)

TRANSMISSION GUY STRAND

Grade Size	High Strength (HS)				Extra High Strength (EHS)					
	1/4"	9/32"	5/16"	3/8"	7/16"	1/4"	9/32"	5/16"	3/8"	7/16"
<u>Manufacturer</u>										
Alcan Cable	X			X	X	X			X	X
Armco Steel Corp.	X		X	X	X	X		X	X	X
Bethlehem Steel	X			X	X	X		X	X	X
CF&I	X		X	X	X	X		X	X	X
Cal-Wire	X	X	X	X	X	X	X	X	X	X
Davis Walker	X	X	X	X	X	X	X	X	X	X
Florida Wire and Cable	X	X	X	X	X	X	X	X	X	X
Indiana Steel and Wire	X	X	X	X	X	X	X	X	X	X
Paulsen Wire Rope Corp.	X			X	X	X			X	X
Seal Wire Co.	X			X	X	X			X	X
Southwire	X	X	X	X	X	X	X	X	X	X
Texstrand	X					X				
U. S. Steel	X		X	X	X	X	X	X	X	X

Note: The buyer should specify Class A, B or C coating per ASTM Specification A475.

y - Galvanized Steel Strand

Applicable Specification: ASTM A363 (Class A, B or C Coating)

OVERHEAD STATIC WIRE

Grade Size	Manufacturer	High Strength (HS)			Extra High Strength (EHS)		
		3/8"	7/16"	5/16"	3/8"	7/16"	
	Alcan Cable	X	X		X	X	
	Armco Steel Corp.	X	X		X	X	
	Bethlehem Steel	X	X		X	X	
	CF&I	X	X		X	X	
	Cal-Wire	X	X		X	X	
	Davis Walker	X	X		X	X	
	Florida Wire and Cable	X	X		X	X	
	Indiana Steel and Wire	X	X		X	X	
	Paulsen Wire Rope Corp.	X	X		X	X	
	Seal Wire Co.	X	X		X	X	
	Southwire	X	X		X	X	
	U. S. Steel	X	X		X	X	

Note: The buyer should specify Class A, B or C coating per ASTM Specification A363.



y-4  
July 1981

y - Steel Strand

Aluminum Clad

Aluminum-clad steel strand for overhead  
ground wire (Alumoweld)

Applicable Specifications: ASTM B 416  
Applicable Sizes : 7 x .106", 7 No. 9 AWG  
7 No. 8 AWG, 7 No. 7 AWG

Copperweld

For guy strand (Alumoweld)

Applicable Sizes: 4M (3 No. 10), 6M (7 No. 12), 8M (7 No. 11),  
10M (7 No. 10), 11.5M (7 x .110"), 12.5M (7 No. 9),  
14M (7 x .121"), 16M (7 No. 8), 20M (7 x .148")

Copperweld



z - Anchors, Expanding and Plate

		<u>DISTRIBUTION</u>			
Designated Maximum					
holding power-lbs.		6000	8000	10,000	12,000
Min. Area - sq. in.		90	100	120	135
Rod Dia. - inches		5/8	5/8	3/4	3/4
Rod Length - feet		7	7	8	-
		<u>Type</u>			
Chance	8 way	88135	88135	88135	88135
Dixie	4 way Plate	D88100-G -	D88115-G D7502-G	D88135-G -	D88135-G D7504-G
Everstick	3 way 4 way	834 -	836 -	8310 84-3/4	- -
Grip-Tite	8 way	A322086G	A322088G	A322812G	A322812G
Joslyn	8 way Plate	J8100-G -	J8115-G J7502-G	J8135-G J7503-G	J8135-G J7504-G
McGraw-Edison	4 way Plate	DA1E5 DA1P7	DA1E6 DA1P8	DA1E6 DA1P9	DA1E7 DA1P10
Power Line Hardware	8 way	8-100G	8-115G	8-135G	8-135G
South Central	8 way	-	84115AG	84135AG	84135AG
Utilities Service	8 way Plate	C88100-G -	C88115-G C617-G	C88135-G C622-G	C88135-G C822-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, plate

Applicable Specification: "REA Specification for Steel Plate Anchors," T-3

TRANSMISSION

Minimum Area 400 sq. in.

Chance

X24 - 3/4

Grip-Tite

XP24 - 3/4 - G

Joslyn

J3524 - 3/4 - G

McGraw-Edison

DA4P7 - 3/4 - G

Power Line Hardware

CP-24G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

z - Anchors, Cone

Designated maximum Holding Power in Hardpan and Rocky Soil	6000	8000	10,000
Min. Required Area	63	104	132
Rod Diameter - inches	5/8	5/8	3/4
Rod Length - feet	7	7	8

Dixie

D8C-G

D10C-G

D12C-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized  
(black asphalt coated) are also acceptable.

z - Anchors, Service

Designated Maximum Holding Power in Sand

	<u>Screw</u>	<u>Expanding</u>
Chance	6346	6870
Dixie	D-6526	-
Grip-Tite	-	322065G
Joslyn	J6526W-CA	J0870-G
McGraw-Edison	DA2N1	-
Power Line Hardware	-	8-70G
Utilities Service	C6346-G	PL62-2.5-G

z - Anchors, Swamp



DISTRIBUTION

	<u>10" dia.</u>	<u>12" dia.</u>	<u>15" dia.</u>
Chance	10150AS	132AS	152AS
Dixie	D-6710-S	D-6713-S	D-6715-S
Joslyn	J2871SG	J2872SG	J2873SG
Utilities Service	C10150A-G	C122A-C	C152A-G

NOTE: Where galvanized anchors are listed, the same anchors ungalvanized (black asphalt coated) are also acceptable.

aa,ab  
October 1981

aa - Nut, eye  
ab - Nut, thimble eye  
5/8 inch

	<u>Eye Nut Conventional</u>	<u>Eye Nut Eyelet</u>	<u>Thimble Eye Nut</u>
			
Barron Bethea	OEN-2A	B-14A	EN-4A
Bethea/National	E-5	B-5	NT-5
Chance	6502	-	6510
Continental Electric	EN-5	BE-5	TN-5
Dixie	D6502	DD-6517	D6510
Flagg (MIF)	P125C	P127A	P128A
Hughes	EN60	-	-
Joslyn	J1092	J1126	J6510
Kortick	K4212	K4413	K3111
Lapp (Line Ware)	304008	306267	304010
McGraw-Edison	DG2E3	DG6E1	DG1E1
Power Line Hardware	OEN-1	BEL-1	-
Utilities Service	450	497	C580

ac  
July 1981

ac - Brace, sidearm diagonal

	<u>1-1/2 inch angle</u> <u>3/16" x 5'</u>	<u>1-3/4 inch angle</u> <u>3/16" x 7'</u>
Chance	-	6984
Joslyn	J1521	J1525
Kortick	K1951	K1954
McGraw-Edison	DB1A1	DB1A5
Utilities Service	5210	5212





ag  
October 1981

## ag - Fuses, Current Limiting, Backup

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
15 kV Class		
Type K-Mate 25	1084	1. To obtain experience.
Catalog No. C70L-31KA	2/19/76	
25 kV Class		2. Must be used in series
Type K-Mate 25	1196	with external expulsion
Catalog No. C70L-32KA	9/18/80	fuse 25 K or 15 T or
		smaller or with CSP
		transformers 50 kVA or
		smaller.
 <u>McGraw-Edison</u>		
15 kV Class		
No. FAH6H45	1094	Same as above.
25 kV Class	7/29/76	
No. FAH7H45		
 <u>Westinghouse</u>		
15 kV Class		
Type CLTX, 25K/15T	1105	Same as above.
25 kV Class	1/6/77	
Type CLTX, 25K/15T		
 <u>RTE</u>		
15 kV Class		
Catalog No. 3553025M11	1140	Same as above.
25 kV Class	6/1/78	
Catalog No. 3554025M11		

ah  
July 1981

ah - Tie, insulator, formed type

Manufacturer

Type

Preformed Line Products

WT "Wraplock"  
(Order for specific  
conductor size and  
insulator)

ST "Groove-Formed"  
side tie (Order for  
specific conductor  
size and insulator)

ah - Tie, insulator, formed type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
Tygard Type AWTY-56* (Side tie for use over armor rod on spool insulator with 1-3/4" groove)	863 4/13/67	To obtain experience.
Super Top-Tie, Type STT for single or double support use, with insulators 2 $\frac{1}{4}$ " through 3 $\frac{1}{2}$ " neck diameter and single support use on spool insulators with 1-3/4" groove diameter (Order for specific conductor size.)	1132 2/2/78  1138 5/4/78	To obtain experience.
<u>Preformed Line Products</u>		
Spool Tie for ACSR, Type SPL* (Side tie for use on spool insulator with 1-3/4" groove)	877 9/14/67	To obtain experience.
DST double support top tie (Order for specific conductor size and insulator)	978 10/28/71	To obtain experience.
DBST double side tie (Order for specific conductor size and insulator)	1057 1/23/75	To obtain experience.

\*Not for side mounting on pin or post insulators.

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Copper-covered steel rods

5/8"

Boggs  
Calpico  
Carolina Galvanizing  
ITT Blackburn  
Joslyn  
Kortick  
Knight  
Power Line Hardware  
Utilities Service  
Weaver  
Wilcor

EB810  
CP588  
P-588  
6258  
J8338  
K5428  
858  
GR-588C  
6617  
W588  
WA588C

Stainless Clad Steel

Manufacturer

5/8"

3/4"

Joslyn  
Teledyne (MEFCO)

J5374  
"PERMAGROUND"

J5377  
"PERMAGROUND"

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

<u>Manufacturer</u>	<u>5/8"</u>	<u>3/4"</u>
Boggs	G588 PTG588**	G348 PTG348**
Carolina Galvanizing	G588 G-588PT**	G348 G-348PT**
Chance	8578 C203-0107**	8618 C203-0109**
Dixie Galvan	D8578 GR6258	D8618 GR7508
General Electric	0982-00002	0982-00003
Grip-Tite	GT588 GT588PT**	GT348 GT348PT**
Joslyn	J3358B* J5328 J5228**	J3458B* J5338 J5238**
Knight	G-588 G-588PT**	G-348 G-348PT**
Kortick	K4658	K4678
Lloyd	6258H	7508H
McGraw-Edison	DN5S8 DN6D8*	DN6S8 DN7D8*
Porcelain Products	7338	7348
Power Line Hardware	GR-588G	GR-348G
Utilities Service	5307	6338
Weaver	8480G	8340G
Wilcor	WA8580G	-

Electro-Galvanized Steel

	<u>5/8"</u>	<u>3/4"</u>
Calpico	G8580	-
LMP	6258E**	7508E**

Stainless Steel

	<u>5/8"</u>	<u>3/4"</u>
Joslyn	23821	23822
Teledyne (MEFCO)	TDY Sol	TDY Sol
Wilcor	WA 588-S	WA 348-S

\*Rod furnished with clamp.

\*\*Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.



ai - Rods, ground, sectional

Galvanized steel and  
copper-covered steel

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Sectional Ground Rods

<u>Manufacturer</u>	<u>8' long</u>	<u>10' long</u>	<u>Couplings</u>	<u>Driving studs</u>
Blackburn	6258S	6260S	60C	60DS
Carolina Galv.	S-588	S-5810	CR58	DS58
Chance Galv. Steel	-	8512	8611	-
Joslyn Galv. Steel	J9158 J23282.8	J9160 J23282.10	J9182 J23282A	J9186 J9186
Knight	S858	S1058	SC58	DS58
Kortick	K5441	K5443	K5482	K5492
McGraw-Edison Galv. Steel	DN17S8	DN16S10	DN1K2	-
Power Line Hardware	GR-588CS	GR-5810CS	CBC-58	DS-58
UTM	-	-	910-030-05	-
Weaver	W-588T	W-5810T	158C	358D



an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	<u>7.2/12.5 &amp; 7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
<u>NECO</u>			
Conventional, single bushing	NC	NCH	
Self-protected, single bushing	NC-1	NCHCB	

Type NC may also be obtained with double gap and internal fuse (NC-2) and with arrester and open link fuse (NC-3).

<u>H. K. Porter (Delta-Star)</u>			
Conventional, single bushing	OS-B3	OS-B3	OS-B3
Self-protected, single bushing	OSP-B3	OSP-B3	OSP-B3
Conventional, two bushing	OS-A	OS-A	OS-A

Types OS-B3 and OS-A may also be obtained with internal fuse.

<u>RTE</u>			
Conventional, single bushing	REA-Conv	REA-Conv	REA-Conv
Self-protected, single bushing	REA-CSP	REA-CSP	REA-CSP
Conventional, two bushing	REA-Conv	REA-Conv	REA-Conv

Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.

<u>Rural Electric Supply Cooperative</u>	
Conventional, single bushing	CONV
Conventional, two bushing	CONV
Self-protected, single bushing	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).

Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop Feed) to designation

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

<u>7.2/12.5 &amp; 7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
-------------------------------------	------------------	-------------------------

United (Ky. AEC)

Conventional, single bushing	SC	SC	DSC
Conventional, two bushing	SC	SC	DSC
Self-protected, single bushing	SCP	SCP	DSCP

SC and DSC may be purchased with  
external fuse and arrester (SP and DSP)

VanTran

Conventional, single bushing	CR
Self-protected, single bushing	CSP-R
Conventional, two bushing	CD

Westinghouse

Conventional, single bushing	S-B3	S-B3	S-B3
Self-protected, single bushing	CSP-B3	CSP-B3	CSP-B3
Conventional, two bushing	S-A	S-A	S-A

Type S-B3 may also be obtained  
with internal fuse, with internal  
fuse and double gap, and with  
lightning arrester and open link  
cutout (Type PC).

Sesco

Conventional, single bushing	RU
Self-protected, single bushing	ESP
Conventional, two bushing	CONV

Type RU may also be purchased with internal fuse and/or lightning arrester.

an - Transformers, Power  
Three-Phase, Step-Down  
for Distribution Substation Use

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
<u>Central Moloney</u>														
34.4	X	X	X	X	X	X	X	X						
43.8	X	X	X	X	X	X	X	X	X					
67.0	X	X	X	X	X	X	X	X	X	X				

General Electric

34.4	X	X		X	X	X	X	X	X	X	X	X		
43.8	X	X		X	X	X	X	X	X	X	X	X	X	
67.0	X	X		X	X	X	X	X	X	X	X	X	X	X
115							X	X	X	X	X	X	X	X
138							X	X	X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

Kuhlman

34.4	X			X	X	X	X	X	X	X	X			
43.8				X	X	X	X	X	X	X	X	X	X	
67.0				X	X	X	X	X	X	X	X	X	X	
115							X	X	X	X	X	X	X	
138							X	X	X	X	X	X	X	

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types TIS and TLH-21 load tap changers.

an - Transformers, Power  
Three-Phase, Step-Down  
for Distribution Substation Use

Primary Voltage-kV	kVA						MVA						
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25

McGraw-Edison

34.4  
43.8  
67.0  
115  
138

X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison  
Types 550, 550B and 550C load tap changers.

RTE-ASEA

34.4  
67.0  
115  
138

X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using RTE-ASEA  
Type UZD load tap changers.

Westinghouse

34.4  
43.8  
67.0  
115  
138

X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse  
Types UTS-A, UTT-B and UVW load tap changers.

an - Transformers, Distribution, Pole Type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Dowzer</u>		
14.4/24.9 kV and Dual Voltage	824	To obtain experience.
	9/19/65	
Conventional, single bushing	1011	
Type CR	3/1/73	
Self-protected, single bushing		
Type CSP-R		
Conventional, two bushing		
Type CD		



Conditional List  
an(1.2)  
July 1981

an - Transformers, Distribution, pole type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Tarrant</u> 7.2/12.5 kV and 7.62/13.2 kV	791 4/30/64	To obtain experience.
Conventional, single bushing Type CB-1		
Conventional, two bushing Type CB-2		
Self-protected, single bushing Type SG-1		
May also be obtained with lightning arrester and internal fuse. Types PSG-1 and PSG-2.		
<u>VanTran</u> 14.4/24.9 kV and Dual Voltage	1075 10/16/75	To obtain experience.
Conventional, single bushing Type CR	1095	
Conventional, two bushing Type CD	8/11/76	
Self-protected, single bushing Type CSP-R		





# an - Transformers, Power Single-Phase, Step-Down for Distribution Substation Use

**Condition of Acceptance:** To obtain experience.

[illegible]

an - Transformers, Power  
Single-Phase, Step-Down  
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	<u>167</u>	<u>250</u>	<u>333</u>	<u>500</u>	<u>833</u>	<u>1250</u>	<u>1667</u>	<u>2500</u>	<u>3333</u>	<u>5000</u>	<u>6667</u>	<u>8333</u>	<u>10,000</u>
Westinghouse	34.4												
	43.8												
	67.0												

S S S  
S S S  
S S S

### an - Transformers, Power Three-Phase, Step-Down for Distribution Substation Use

**Condition of Acceptance:** To obtain experience.

Primary																				
Voltage-kV																				
	750	1000	1500	2000	2500	3750														
	kVA																			
	5	7.5	10	12	15	20	25	30												
	MVA																			
Central Moloney																				
34.4																				

Federal Pacific

[illegible]

Transformers 5 MVA and larger also accepted as load tap changing transformers using Federal Pacific Type TC-546 load tap changers.

**General Electric**

34.4	2
43.8	2
115	2
138	2

transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65 and LRT-200 load tap changers.

ao  
July 1981

ao - Bolt, straight, thimble type eye

Applicable Specifications: Edison Electric Institute  
Specification TD-4 1958,  
"Specifications for Eye Bolts"

Applicable Sizes : 5/8 inch, 6 through 12 inch length  
3/4 inch, 8 through 12 inch length

The following manufacturers have shown compliance with the applicable specifications:

A. B. Chance Company  
Dixie Electrical Manufacturing Company

Joslyn Mfg. and Supply Company  
Kortick Manufacturing Company  
\*McGraw-Edison

Utilities Service Company



\*"Static proof" designs available.

ap - Clamp, hot line  
Copper and Copperweld-copper Conductor

<u>Conductor Size</u>			
Copper	2/0	1/0	2 thru 6
Copperweld-copper	<u>      </u>	<u>2A</u>	<u>4A thru 8A</u>
Blackburn	PGH3	PGH3	PGH3
Fargo	GH-209	GH-209	GH-209
Weaver	IWS	IWS	IWS

Clamps listed below have springs and enclosed thread chambers.  
They are recommended for use in areas where severe corrosion  
or vibration trouble is experienced.

Anderson	BH-00	BH-00	BH-00
Chance	S1530CC	S1520CC	S1520CC
Electrical Specialty	BHC	BHC	BHC
Fargo	GH-101	GH-101	GH-100
Ideal	3532	3532	3532
Penn-Union	HLC-020-LS	HLC-020-LS	HLC-020-LS



ap - Clamp, hot line  
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.  
They are recommended for use in areas where severe corrosion or vibration  
trouble is experienced.

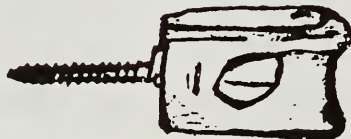
Conductor Size		4/0 & 3/0	2/0	1/0 & 2	4
	<u>Tap Conductor</u>				
<u>Anderson</u>	Aluminum	HLP-7	HLP-7	AH-4	AH-4
<u>Chance</u>	Aluminum	S1540-AA	S1540-AA	S1530-AA	S1530-AA
	Copper	S1540-AC	S1540-AC	S1530-AC	S1530-AC
<u>Fargo</u>	Aluminum	GH-102A	GH-102A	GH-101A	GH-101A
	Copper	GH-102AC	GH-102AC	GH-101AC	GH-101AC
<u>Weaver</u>	Aluminum	W-1066AA	W-1066AA	W-6336AA	W-6336AA
<u>Utilco</u>	Aluminum	-	HLC-397	-	HLC-40

ar  
July 1981

ar - Wireholder

Applicable Specification: "REA Specification for Service Wireholders," D-15

	<u>With #22 Wood Screw</u>	<u>With 3/8" x 5" Bolt</u>
Chance	3-11-44	-
Dixie	D3-11-44	-
Joslyn	J089	-
McGraw-Edison	DW1R1	-
Porcelain Products	1986	-
Universal Clay Products	415	-



Note: For triplex type service cable see clevis type wireholders on page "bt."

at - Guy Marker

8 Foot Length

Plastic or Fiberglass

<u>Manufacturer</u>	<u>Catalog Number</u>
Chance	96-PBG-2 (Gray) 96-PBG-2Y (Yellow) 96-PBG-2GRN (Green) 96-PBG-2ORG (Orange)
Chance*	96-FRG-GRY (Gray) 96-FRG-YEL (Yellow) 96-FRG-GRN (Green) 96-FRG-ORG (Orange)
Electrical Materials*	70-5 (Gray) 70-5Y (Yellow)
Joslyn	J1491Y (Yellow) J1491G (Gray)
Nordic	HRG-8 (Orange)
Preformed Line Products*	PG-5508 (Gray) PG-5518 (Yellow)
Radar Engineers*	6031 (Yellow)
Virginia Plastics*	TG-125-8G (Gray) TG-125-8Y (Yellow)
Virginia Plastics**	FG-8G (Gray) FG-8Y (Yellow)

\*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

\*\*Available with either 1 or 2 bolt clamps.

Conditional List

at  
October 1981

at - Reflective Guy Marker  
8-foot length

Plastic or Fiberglass

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*Nordic HG-815 yellow	1061 3/20/75	To obtain experience.

\*For use with formed or automatic type deadends for guy strand; will not fit over bolt type guy clamps.

av - Conductor, ACSR

Applicable Specifications: ASTM Specification B 232-78  
(or latest revision)

Preferred Sizes:	<u>Distribution</u>	<u>Transmission</u>
	4 - 6/1	1/0 - 6/1
	4 - 7/1	2/0 - 6/1
	2 - 6/1	3/0 - 6/1
	2 - 7/1	4/0 - 6/1
	1/0 - 6/1	266.8 kcmil - 26/7
	2/0 - 6/1	336.4 kcmil - 26/7
	3/0 - 6/1	477 kcmil - 26/7
	4/0 - 6/1	556.5 kcmil - 26/7
		795 kcmil - 26/7
		954 kcmil - 54/7

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable

Aluminum Company of America

Anaconda Ericsson

Essex (Paranite)

Kaiser

Nehring

Noranda

Pirelli Cable

Reynolds

Southwire



av-2  
October 1981

av - Conductor, copper

Applicable Specifications: ASTM Specification B 1-70 (or latest revision) for hard-drawn solid  
ASTM Specification B 3-63 (or latest revision) for soft or annealed solid  
ASTM Specification B 8-72 (or latest revision) for hard-drawn stranded and soft stranded

Preferred Sizes:	Hard-drawn solid	4 and 6
	Soft or annealed solid	4 and 6
	Hard-drawn stranded	2x3, 1/0 x 7, 2/0 x 7
	Soft stranded	4 and 6

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable

Anaconda Ericsson

Essex (Paranite)

General Cable

Hatfield (Sizes 4 & 6)

Phelps Dodge

Rome Cable

Southwire

av - Conductor, Copperweld-copper

Applicable Specification: ASTM Specification B 229-71  
(or latest revision)

Preferred Sizes:	<u>Distribution</u>	<u>Transmission</u>
	8A	1/0 F
	6A	2/0 F
	4A	3/0 F
	2A	4/0 F

The following manufacturers have shown compliance with the applicable specification for the sizes indicated:

Anaconda Ericsson	(2A and smaller)
Copperweld Steel	(All sizes)
Southwire	(2A and smaller)

av - Conductor, Service  
(Single Conductor)

<u>Manufacturer</u>	<u>Aluminum</u>	<u>Copper</u>
Alcan Cable	x	x
Alcoa	x	
Anaconda Ericsson	x	x
Essex (Paranite)	x	x
Kaiser	x	
Phelps Dodge	x	
Pirelli Cable	x	x
Reynolds	x	
Rome Cable	x	x
Southwire	x	x

Applicable Specification: IPCEA-NEMA Standard S-66-524

Insulation: Cross-linked thermosetting polyethylene or equal,  
meeting requirements of Sections 7.3.3 and 7.3.5

Conductor: Physically and electrically equal to MHD copper or  
HD (EC-H19) aluminum, meeting requirements of Section 7.3.2  
(Compact or compressed stranded conductor is acceptable.)

Marking: Manufacturer's name and type of insulation shall be clearly  
shown in durable markings on the surface of the insulation  
at intervals no greater than 24 inches.

October 1981

av - Conductor, Service Cable  
(Triplex and Quadruplex)

<u>Manufacturer</u>	<u>Aluminum</u>	<u>Copper</u>
Alcan Cable	x	x
Alcoa	x	
Anaconda Ericsson	x	x
Essex (Paranite)	x	x
Hendrix	x	x
Kaiser	x	
Pirelli	x	x
Reynolds	x	
Rome Cable	x	x
Southwire	x	x

Applicable Specifications: REA Specification D-2, Specifications for  
600 Volt Neutral-Supported Secondary Service  
Drop Cables

av-6  
July 1981

av - Conductor, Aluminum Alloy

Applicable Specification: ASTM Specification B399-78

Preferred Sizes:

<u>DISTRIBUTION</u>			<u>TRANSMISSION</u>		
<u>6201</u>		<u>ACSR Equiv.</u>	<u>6201</u>		<u>ACSR Equiv.</u>
48,690 cmil - 7 str.*		4	123,300 cmil - 7 str.**		1/0
77,470 cmil - 7 str.*		2	155,400 cmil - 7 str.**		2/0
123,300 cmil - 7 str.		1/0	195,700 cmil - 7 str.**		3/0
155,400 cmil - 7 str.		2/0	246,900 cmil - 7 str.		4/0
195,700 cmil - 7 str.		3/0	312,800 cmil - 19 str.	266,800 cmil	
246,900 cmil - 7 str.		4/0	394,500 cmil - 19 str.	336,400 cmil	
			559,500 cmil - 19 str.	477,000 cmil	
			652,400 cmil - 19 str.	556,500 cmil	
			927,200 cmil - 37 str.	795,000 cmil	

\*Not recommended for multiphase lines with span lengths exceeding 300 ft.

\*\*Not recommended for suspension type construction.

The following manufacturers have shown compliance with the applicable specifications:

<u>Manufacturer</u>	<u>Type</u>
Alcan	6201
Alcoa	6201
Kaiser	6201
Reynolds	6201
Southwire	6201



ay  
July 1981

ay - Cutout and gap, combination

<u>Manufacturer</u>	<u>Type of Mounting</u>	<u>7.2/12.5 kV 50 amp*</u>	<u>14.4/24.9 kV 50 amp*</u>
RTE	Transformer	32-2674A03	32-2674A06

\*These combinations contain the open-link type of cutout.

az  
October 1981

az - Pole Numbers and Letters, Metal

(See Drawing M52-3)

Manufacturer

Almetek Industries, Inc.

Premax Products

Catalog No.

"E-Z Tags"

Order by description

1523

cq.  
July 1981

cq - Deadend, Secondary

(For use on secondary deadends only)

Copper  
Offset Compression

Conductor Size:	4	6
National Telephone Supply	91-204-P	91-162-J

Copperweld-Copper  
Offset Compression

Conductor Size:	6A	8A
National Telephone Supply	91-6A-P	91-8A-P



Copperweld-Copper  
Automatic Deadend

Conductor Size:	6A	8A
-----------------	----	----

cr  
October 1981

cr - Bracket, Angle Suspension

Applicable Specifications: "REA Specification for Angle Suspension  
Brackets," DT-4

<u>Manufacturer</u>	<u>Distribution</u> <u>5/8"Dia.</u>	<u>Transmission</u> <u>3/4"Dia.</u>
Chance		5728
Joslyn	J7935	J7936
Kortick	K6231	K6230
McGraw-Edison	DC8E1	DC8E2
Utilities Service	545	546

Angle Bracket, Swinging

Applicable Specification: T-8  
Drawing : TM-111A, TM-111B

Swinging angle bracket with hardware and  
fittings (for 230 kV transmission)

<u>Manufacturer</u>	<u>TM-111A</u>	<u>TM-111B</u>	<u>Type #1</u>	<u>Type #2</u>
American Crossarm & Conduit Company	AC8801	AC8802	X	X
Brooks	64233A	64233B	X	X
Hughes	2848	2848	X	X
Joslyn	REA 64-8A	REA 64-8B	X	

dd  
July 1981

dd - Adapter, Insulator

(For adapting machine bolt to pin insulator thread)

Bolt Size, Inches	5/8	5/8
Insulator Thread Dia., Inches	<u>1</u>	<u>1-3/8</u>
<u>Manufacturer</u>		
Chance	4258	-
Joslyn	J2840	J2841
McGraw-Edison	DP1A1	DP1A2

dh - Ground, pole

(For system grounds see ground rods on page a1.)

Manufacturer

Catalog Number

Galvanized Steel Plate With Insulated  
Copper Lead

(For connecting to a copper or aluminum  
ground wire above ground.)

Blackburn  
Joslyn

GP-2  
JO55W

Power Line Hardware  
Weaver

PGPS-56CL8  
GSP-1

Galvanized Steel Plate With Connector

(For connecting to a galvanized iron  
ground wire.)

Blackburn  
Joslyn  
McGraw-Edison

GP-2C  
JO55  
DN13M1

Power Line Hardware  
Weaver

PGPS-56C  
GSP-2

Copper Plate

Blackburn  
Joslyn  
Power Line Hardware  
Somerset (Thomas & Betts)  
Weaver

GP-100  
J-9196  
PGPC-56  
5575  
PBH



dt  
July 1981

dt - Deadend, service

For deadending triplex type service cable, Drawing K10C.

<u>Manufacturer</u>	<u>ACSR Size</u>	<u>Wedge Type</u>	<u>Catalog No.</u> <u>Formed Type</u>
Blackburn	4	W6-4AA	-
	2	W6-2AA	-
	1/0	W2-0AA	-
Burndy	4	CW2R-1	-
Chance	4	-	CSG-030
	2	-	CSG-050
	1/0	-	CSG-070
Joslyn	4 & 2	R7295	-
	1/0	R7287	-
Penn-Union	4 & 2	WDC-2S	-
	1/0	WDC-10S	-
Preformed Line Products	4	-	SG-4502
	2	-	SG-4504
	1/0	-	SG-4506
Reliable	4 & 2	7295	-
	1/0	7287	-

du

October 1981

du - Link, Extension

DISTRIBUTION

Manufacturer

Catalog Number

Bethea/National

LCE-14

Chance

C207-0112

Continental

CEL-14

Flagg (MIF)

PA320

McGraw-Edison

DC33B6

Utilities Service

495

Transmission

Continental

CEL-14

Brown Boveri Electric (ITE)

3074A

Joslyn

J7712

(Bolted) (High Strength)

J22609

Knox

3074A

McGraw-Edison

DC152B1

Guy Extension Link  
(For "H" Structure)

Manufacturer

One Guy Attachment

Two Guy Attachment

Joslyn

J22421

J22523

NOTE: The distribution extension links may be substituted for anchor shackle (Item bo), eye bolt (Item o) and eye nut (Item aa) for both small and large conductor drawings shown in REA Forms 803 and 804 at the option of the owner.

eh  
July 1981

eh - Hook, ball

<u>Manufacturer</u>	<u>Catalog No.</u>
Anderson Elec./Square D	HB-30
Bethea/National	BH-5
Continental Electric Company	BH-30-5
Brown Boveri Electric (ITE)	3001
Joslyn (Brewer-Titchener)	3001-HT
Knox	3001
Lapp	7055
Ohio Brass	78420

ei - Clamps, suspension with socket eye

ACSR with Straight or Formed Armor Rods

	AWG		kcmil							
	1/0 & 2/0	3/0	4/0	Iron or Steel Clamps			477	556.5	795	954
				MS-104-S	MS-104-S	-	-	-	-	-
Anderson	MS-82-S	-	-	-	-	-	-	-	-	-
Barron Bethea	FGW-4S	-	-	-	-	-	-	-	-	-
Bethea/National	FS-83-S	-	-	-	-	-	-	-	-	-
Brown Boveri Electric (ITE)	6203	6204	6204	6205	6255	6257	-	-	-	-
Joslyn	6203	6204	6204	6205	6255	6257	-	-	-	-
(Brewer-Titchener)										
Knox	6203A-U	6204A-U	6204A-U	6205A-U	6255A-U	6257A-U	-	-	-	-
Lapp	305743S	-	-	-	-	-	-	-	-	-
Ohio Brass	83085	83105	83105	83115	83125	83145	-	-	-	-

ACSR with Straight or Formed Armor Rods

	AWG		kcmil					
	1/0 & 2/0	3/0 & 4/0	Aluminum Alloy Clamp					
			266.8	336.4	477	556.5	795	954
<u>Aluminum Alloy Clamp</u>								
Anderson	HAS-85-S	HAS-104-S	HAS-104-S	HAS-118-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS
Bethea/National	LS-1-S	LS-2-S	LS-2-S	LS-3-S	LS-4-S	LS-6-S	LS-7-S	LS-8-S
C & R	CRSC-1S	CRSC-2S	CRSC-3S	CRSC-3S	-	-	-	-
Dulmison	-	AGS	AGS	AGS	AGS	AGS	AGS	AGS
Brown Boveri Electric (ITE)	9503-U	9504-U	9504-U	9505-U	9506-U	-	-	-
Joslyn	9503-S	9504-S	9504-S	9505-S	9506-S	-	-	-
(Brewer-Titchener)								
Knox	9503-U	9504-U	9504-U	9505-U	9506-U	-	-	-
Lapp	306029S	306030S	306030S	306031S	306032S	-	-	-
Ohio Brass	87085	87105	87105	87115	87135	-	-	-
Preformed	-	AGS	AGS	AGS	AGS	-	-	-

\*Clevis type available.

fj - Bracket, extension

(For use in mounting oil circuit reclosers or sectionalizers)  
See Drawing VM3-10A

	<u>Through Bolt Type</u>	<u>Band Type</u>
Aluma-Form	TBRSM-1, TB2M1=6*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357M	
McGraw-Edison	DR2E3	

\*For mounting double lug reclosers.

fk - Bracket, oil circuit recloser or sectionalizer

(For cluster mounting of three oil circuit reclosers on pole)

Aluma-Form	653-9*
*McGraw-Edison	DT8C1
Turner	695-3

\*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Turner	3CT-PT



fm  
October 1981

fm - Bracket, Arrester and Pothead Extension

For Distribution Arrester and Cutout - Pole Mounting

<u>Manufacturer</u>		<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form		1HCA-18 Series	R3CA-48
Anderson/ Square D	12.5/7.2 kV 24.9/14.4 kV	COB-E-120-TGL COB-E-180-TGL	
Bethea/National	12.5/7.2 kV 24.9/14.4 kV	VIB3-12F-GC VIB3-18-GC	
Chance		C653-1038	C653-1056
Continental	12.5/7.2 kV 24.9/14.4 kV	IACB-12-5LGE IACB-18-5LGE	GPB-3-0-568M-3012-CAT 12 GPB-3-0-568M-4017-CAT 12
Dixie	12.5/7.2 kV 24.9/14.4 kV	D-1580	D27211-G
Flagg (MIF)	12.5/7.2 kV 24.9/14.4 kV	PA613H PA619H	
Lapp	12.5/7.2 kV 24.9/14.4 kV	304036-G 304038-G	
McGraw-Edison		DC34B3	
Power Line Hardware	12.5/7.2 kV	CA-12-3GL	
Shakespeare		892-18	670-40

For two distribution arresters in parallel or one  
arrester and cutout - crossarm mounted

<u>Manufacturer</u>	<u>Catalog No.</u>
McGraw-Edison	DM23B2

For Intermediate Arrester Mounting

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form	WBMA-1	R3CSA-48



sd  
July 1981

sd - Current Transformers  
Outdoor Types

<u>Manufacturer</u>	<u>.6 kV</u>	<u>15 kV</u>	<u>25 kV</u>	<u>34.5 kV</u>	<u>69 kV</u>
Associated Engineering	GT	BB-15	BB-25	LG-34.5 COF	
	HA	LG-15	LG-25		
	WEO		COF		
Astra	AA				
	TFW				
	AB				
	AD				
Duncan	DCEW				
	DCCW				
	DCAB				
General Electric	JCR-O	JKW-5	JKW-6	JKW-7	JKW-350
	JCW-O	JCK-5	JKW-150	JKW-200	KG-350
	JAK-O		KG-150	KG-200	
	JAD-O				
Sangamo	B6 Type	SMC-150			
Westinghouse	CSF/CMS		ACT-150	ACT-200	ACT-350
	CMF	KOR-11			
	CLC/CLE	KON-11	KOR-15		

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

Conditional List

sd

October 1981

sd - Current Transformers  
Outdoor Types

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Electromagnetic Ind.</u>		
Type UMCT, 0.6 kV	971 (7/15/71)	To obtain experience.
Type UCT, 0.6 kV	981	
Type C03-110, 15 kV	12/16/71	
Type C03-150, 25 kV	1076	
Type C03-200, 34.5 kV	10/30/75	
Type IK-350, 69 kV	1216	
	7/23/81	
<u>Balteau Standard</u>		
Type KEWO-110, 15 kV	1212	To obtain experience.
Type KEWO-150, 25 kV	5/21/81	
Type KEWO-200, 34.5 kV		
Type KEWO-350, 69 kV		

se - Voltage Transformers

<u>Manufacturer</u>	<u>Outdoor Types</u>					
	<u>.6kV</u>	<u>1.2kV</u>	<u>15kV</u>	<u>25kV</u>	<u>34.5kV</u>	<u>69kV</u>
Associated Engineering	CL TL		PTT-150 SPOF-100 PTT-110	PTT-150 SPOF-150	POF-200	
Duncan	DVE-6 DVF-6					
General Electric	JVA-0 JVP-0		JW-5 JW-110	JW-6 ET-150 JVT-150	JW-7 ET-200 JVT-200	ET-350 JVT-350
Sangamo	T6A T7		SMP-150			
Westinghouse	PPM		VOG-11 VOZ-11	PTOM-150 APT-150	APT-200	APT-350 LPT-350

NOTE: The transformer types listed above are acceptable in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

## Conditional List

se

October 1981

## se - Voltage transformers

Outdoor Types

<u>Manufacturer</u>	<u>Meeting No. &amp; Date</u>	<u>Conditions</u>
<u>Astra</u>		
Type DB, 0.6 kV	1087	To obtain experience.
Type DA, 0.6 kV	4/1/76	
<u>Electromagnetic Industries</u>		
		To obtain experience.
Type U-2-350, 69 kV	1216(7/23/81)	
Type PO4-110, 15 kV	1076	
Type PO4-150, 25 kV	10/30/75	
Type PO4-200, 34.5 kV		
Type U-450, 0.6 kV	1080(12/23/75)	
<u>Balteau Standard</u>		
VE02-110, 15 kV	1212	To obtain experience.
VE05-110, 15 kV	5/21/81	

zz - Poles

Thermal (Non-Pressure) Treatment

	<u>Insured Warranted</u>	<u>Independently Inspected</u>
J. H. Baxter & Co.	-	Quendall, Wash. Arlington, Wash.
Bell Lumber & Pole Co.	-	Minneapolis, Minn.
Ted Butcher, Inc.	-	Sandpoint, Idaho
Cascade Pole Co.	-	Tacoma, Wash.
Cedar Service, Inc. (R. G. Haley and Co., Inc.)	-	Bemidji, Minn.
Idaho Pole Co.	Bozeman, Mont.	Bozeman, Mont.
Kalispell Pole & Timber Co.	-	Kalispell, Mont.
MacGillis and Gibbs Co.	-	Minneapolis, Minn.
L. D. McFarland Co.	Eugene, Ore. Sandpoint, Idaho	Eugene, Ore. Sandpoint, Idaho
Oeser Cedar Co.	-	Bellingham, Wash.
Page & Hill Forest Products	-	Big Falls, Minn.
Poles Incorporated	-	Newport, Wash.





## PART II

### Underground Distribution Equipment

The realm of underground distribution has made quite significant advances in the past few years. Due to these advances and the increasing feasibility of underground rural distribution, most REA borrowers have placed some distribution equipment underground, are presently planning to, or are anticipating doing so in the future. If borrowers are to obtain reliable and economical underground systems, approved standards for construction and equipment must be observed.

Underground equipment considered suitable is being included in the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers." Specifications have been written and are available on much of this equipment. It must be realized that very little operating experience is available on this type equipment. Therefore, much of the underground equipment will be listed as "Conditional" until such experience is obtained that will warrant removing the "Conditional" listing. Listing of an item as "Conditional" does not mean that the item is inferior. Conditional means that service experience is desired so the item can be properly evaluated and demonstrates satisfactory performance before consideration for final acceptance.

Any comments or suggestions regarding the use or operation of the listed underground equipment will be welcome.

U ae - Surge Arresters, Distribution  
for Underground System Pole Risers  
(Lightning Arresters)

<u>Manufacturer</u>	<u>Arrester Class</u>	<u>Arrester Type</u>	<u>Ratings - kV</u>
General Electric	Distribution, heavy duty	Alugard	9, 10, 18
	Intermediate	Alugard	9, 10, 18
Joslyn	Distribution, normal duty	Q	9/10, 18
	Distribution, heavy duty	J	9/10, 18
	Intermediate*	RS	9, 10, 18
Kearney	Distribution, heavy duty	Unigap	9, 10, 18
McGraw-Edison	Distribution, normal duty	ES	9/10, 18
	Distribution, heavy duty	EL	9, 10, 18
	Intermediate	RP2	9/10, 18
Ohio Brass	Distribution, normal duty	DA-III	9/10, 18
	Distribution, heavy duty	DA-IV	9, 10, 18
	Intermediate	GP	18
Westinghouse	Distribution, normal duty	GLV	9, 10
	Distribution, normal duty	LVBB	18

\*Has intermediate class arrester characteristics but does not have intermediate class venting capability.

NOTE: The arresters listed on this page may be used singly or in parallel, but must be applied in accordance with paragraph VI.A., in REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

U fz - Transformer Connector Block, Insulated  
Multiple Cable Connectors

Non-Watertight - For use in above grade locations only

<u>Manufacturer</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Alcoa	Lug	Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots
Alcon	Set Screw	VBTT Series with double sealing sleeve
Burndy	Lug	Stud Mole
Electrical. Spec. Prod.	Lug	Type SU (Permanent)
	Lug	Types SUR and RDSR (Removable) (With Types LA and A1 lugs and sleeve kits)
	Set Screw	Type UPS-I (Permanent)
	Set Screw	Type UPM-I (Disconnectable)
Fargo	Bolted	GUC Series
	Set Screw	GUS-200S Series
Homac	Lug	DF Series
	Lug	FTU 125 Series (Disconnectable) with flood seal sleeve kit
	Set Screw	UT-R Series
ITT	Lug	SCU, with lugs and sleeves
	Set Screw	TSB-J58C (Permanent)
	Set Screw	TSB-D58C (Disconnectable)
Penn Union	Lug	Type DBAT-LH (Disconnectable) Use with Series DBTB, DBTBF and DBTH lug and sleeve kits
	Lug	
Reliable	Set Screw	15912-REA (Disconnectable)
RTE	Set Screw	Uni-Joint (Disconnectable)
	Set Screw	Uni-Joint (Permanent)
Utilco	Set Screw	PTF-IN (Permanent)
	Set Screw	PTF-IN-J (Disconnectable)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U fz-2  
October 1981

U fz - Transformer Connector Block, Insulated  
Single Cable Connectors

Non-Watertight - For use in above grade locations only

Manufacturer

Catalog Number

Electrical Spec. Prod

Type SM transformer bushing  
connector kit. (Stud to  
aluminum cables through  
350 kcmil)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.



U gp - Connector Blocks and Splices, Secondary

Watertight - For Use In All Locations

<u>Manufacturer</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Alcoa	Lug	Interchange-I ABB Series Use with A-9 insulating boots
Alcon	Set Screw	VPB Series
AMP	Compression	600 Volts secondary UG Distribution 4-way and 6-way bus system
Blackburn	Lug Set Screw	Series UP (with lugs and sleeves) Series UB (1000 amp bus with sleeves)
Burndy	Lug	URD Mole
Electrical Spec. Prod.	Lug Set Screw	Type UC (8 AWG - 500 kcmil) (with LA lug and sleeve) Type UB (with sleeve) Splice Type ACL-HSH (6AWG - 500 kcmil)
Fargo	Set Screw	GU-500 Series
Homac	Lug Lug Set Screw	FS-95 Series with flood seal sleeve kit (8 AWG - 350 kcmil) FS-125 Series with flood seal sleeve kit (350 - 500 kcmil) SHC Series
Kearney	Compression Compression	HCR HAR
Penn Union	Lug	DBA Series with DBTB, DBTBF and DBTH Series lug and sleeve kits
Reliable	Set Screw	15903-15908, 15910 with sleeve kit (4 AWG - 350 kcmil) 15911 with sleeve kit (500 - 750 kcmil)
RTE	Compression	Aqua Guard Splice Kit
Utilco	Set Screw	Safety Sub Splice - USPA-350SS

Non-Watertight - For Use in Above-Grade Pedestals Only

Electrical Spec. Prod.	Set Screw	UP-B Series
Fargo	Set Screw	GUS-200 Series

U gq  
July 1981

U gq - Boot or sleeve, insulated\*

Manufacturer

ITT Blackburn

Catalog Number

MPC9  
MPC15

Electrical Materials

100-B (for pad-mounted  
transformer spade  
terminals)

\*Use restricted to 120/208 volt 500 kVA transformers and larger not  
equipped with threaded studs.



U hv - Cable, Underground  
25 kV Cable

Applicable Specification: REA Specification U-1  
Conductor : Copper or Aluminum  
                              #2 AWG through 1000 kcmil  
Insulation : High Molecular Weight (HMW) or cross-  
                              linked (XL) polyethylene  
Neutral : Copper Concentric Neutral

<u>Manufacturer</u>	<u>Insulation</u>	<u>Flat Strap Neutral Available</u>	<u>Stabilized Neutral Design*</u> Ridg-Lok
Alcoa	HMW or XL	Yes	
Anaconda Ericsson	XL	No	
Essex (Paranite)	XL	Yes	
Hendrix	HMW or XL	No	Neu-Lok
Okonite	XL	Yes	
Phelps Dodge	XL	Yes	
Pirelli	HMW or XL	Yes	STA-SERVE
Reynolds	HMW or XL	Yes	Secure-Neutral
Rome	HMW or XL	Yes	Serve-Lock
Southwire	XL	No	
Triangle	XL	Yes	

\*Accepted design meeting the requirements of 7.5.2 REA Specification U-1,  
for a minimum neutral with a maximum lay.

U hv - Cable, Underground

600 Volt Cable

Applicable Specification: REA Specification U-2  
Conductor : Copper, #4 AWG and larger  
Aluminum, #2 AWG and larger  
Insulation : Cross-linked polyethylene (XLPE)

<u>Manufacturer</u>	<u>Type Conductor</u>
Alcan	Copper or Aluminum
Alcoa	Aluminum
Anaconda Ericsson	Copper or Aluminum
Collyer	Copper or Aluminum
Essex (Paranite)	Copper or Aluminum
General Electric	Copper or Aluminum
Hatfield	Copper
Kaiser	Aluminum
Okonite	Copper or Aluminum
Phelps Dodge	Copper or Aluminum
Pirelli	Copper or Aluminum
Reynolds	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum
Triangle	Copper or Aluminum

NOTE: The manufacturers shown above have indicated that their 600 volt cable is suitable for use on 480 volt corner grounded delta circuits.

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification: REA Specification U-2

Conductor : Copper, #4 AWG and larger

Aluminum, #2 AWG and larger

Insulation : Cross-linked polyethylene (XLPE)

<u>Manufacturer</u>	<u>Type Insulation</u>	<u>Type Conductor</u>	<u>Cable Configuration</u>
Alcan	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Alcoa	XLPE	Aluminum	3 Insulated Conductors Triplexed
Anaconda Ericsson	XLPE	Copper or Aluminum	3 Insulated Conductor Triplexed
Essex (Paranite)	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
General Electric	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Hatfield	XLPE	Copper	3 Insulated Conductors Triplexed
Kaiser	XLPE	Aluminum	3 Insulated Conductors Triplexed
Okonite	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Pirelli	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Reynolds	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Rome Cable	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Southwire	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed
Triangle	XLPE	Copper or Aluminum	3 Insulated Conductors Triplexed

NOTE: The above cable may be supplied with UL label for Type USE.

Conditional List

U hv(1)

July 1981

U hv - Cable, Underground  
(15 or 25 kV cable)

TREE RETARDANT

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Reynolds</u>		
Reynotree HMW	1114(5/12/77)	To obtain experience
	1134(3/2/78)	
	1196(9/18/80)	
DFDA-6202 HMW	1151(11/16/78)	
	1196(9/18/80)	
<u>Rome Cable</u>		
Treban 100 HMW	1146(8/31/78)	To obtain experience
	1196(9/18/80)	
DFDA-6202 HMW	1155(1/18/79)	
	1196(9/18/80)	
<u>Hendrix</u>		
DFDA 6202 HMW	1151(11/16/78)	To obtain experience
	1198(10/23/80)	
<u>Alcoa</u>		
DFDA 6202 HMW	1148(9/28/78)	To obtain experience
	1198(10/23/80)	
<u>Pirelli</u>		
DFDA-6202 HMW	1152(12/7/78)	To obtain experience
	1202(12/18/80)	

## Conditional List

U sd

July 1981

## U sd - Current Transformers

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Sangamo</u> Current transformers, direct burial, 600 v. Type KU-6 Type K2U-6 Type GU-6 Type HU-6	940 4/2/70	To obtain experience.



U si-1  
October 1981

U si - Anodes, Sacrificial  
(Drawings UMI1-1, UM-26, UM27, M2-7)

Zinc Anodes\*

	<u>Pre-Packaged With Connecting Wire</u>			<u>Bare Continuous Strip (Ribbon)</u>	
	5.5 kg (12 lbs)	13.6 kg (30 lbs)	27.2 kg (60 lbs)	16 mm x 22 mm (5/8" x 7/8")	13 mm x 14 mm (1/2" x 9/16")
Federated Metals	S-12 packaged	S-30 packaged	S-60 packaged	Regular size Type II	Junior size
Harco	AZC12GJ	AZC30GJ	AZC60HJ		

\*When ordering, specify zinc anodes that meet ASTM B418-73 Type II Composition and REA Specification DT-9, "REA Specification for Zinc Sacrificial Anodes."



U si - Anodes, Sacrificial  
(drawings UM-11-1, UM-26, UM-27, M2-7)

U si-2  
October 1981

Magnesium Anodes\*\*

	<u>Standard Potential</u>			<u>High Potential</u>			
	7.7 kg (17 lbs)	14.5 kg (32 lbs)	22.7 kg (50 lbs)	7.7 kg (17 lbs)	9 kg (20 lbs)	14.5 kg (32 lbs)	21.8 kg (48 lbs)
Federated Metals	17 packaged	32 packaged	50 packaged				
Harco	AMC17J	AMC32J	AMC50J	AMC17G		AMC32G	AMC48G
Kaiser Mag.	17 Vibra Pak	32 Vibra Pak	50 Vibra Pak	17 Electromag Vibra Pak		32 Electromag Vibra Pak	50 Electromag Vibra Pak
General Corrosion Services	17 packaged	32 packaged	50 packaged	17D3 packaged	20D2 packaged	35D5 packaged	48D5 packaged

\*\*When ordering, specify magnesium anodes that meet REA Specification DT-10,  
"REA Specification for Magnesium Sacrificial Anodes."

THE UNIVERSITY OF CHICAGO  
LIBRARY

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New York 22, New York

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Sincerely,  
The University of Chicago Library

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